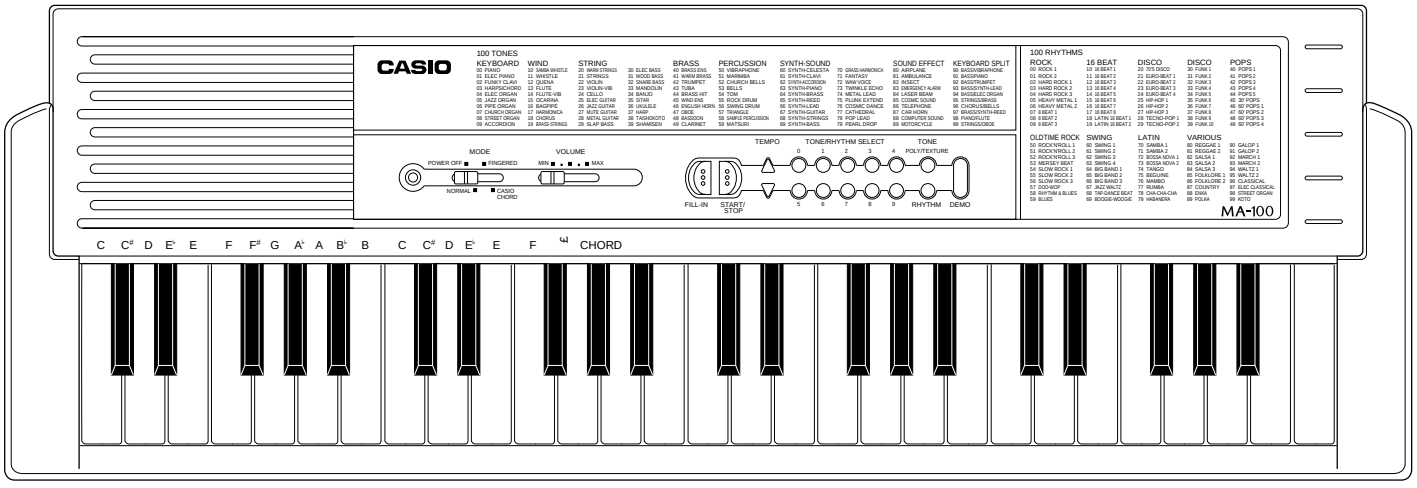
CASIO®

Service Manual

(without price)

MA-100



MA-100

ELECTRONIC KEYBOARD

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SPECIFICATIONS

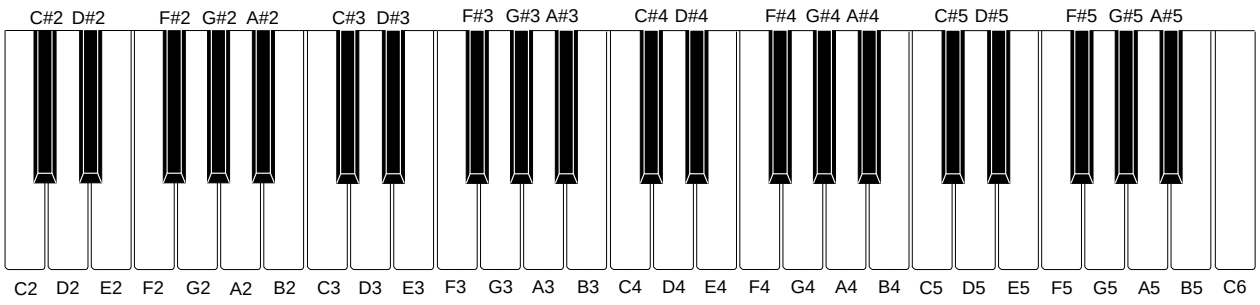
GENERAL

Number of keys:	49
Polyphonic:	8-note
Preset tones:	100
Auto-rhythms:	100
Auto-accompaniment:	CASIO Chord/Fingered
Demonstration tune:	Classical Medley
Built-in speakers:	8 cm dia. 1.1 W Input Rating: 1 pc.
Terminal:	AC Adapter Jack (DC 7.5 V)
Power source:	2-way AC or DC source AC: AC adapter DC: 5 AA size dry batteries
Power consumption:	1.8 W
Dimensions(HWD):	63 x 650 x 217 mm (2-1/2 x 25-9/16 x 8-1/2 inches)
Weight:	1.4 kg (3.1 lbs) excluding batteries

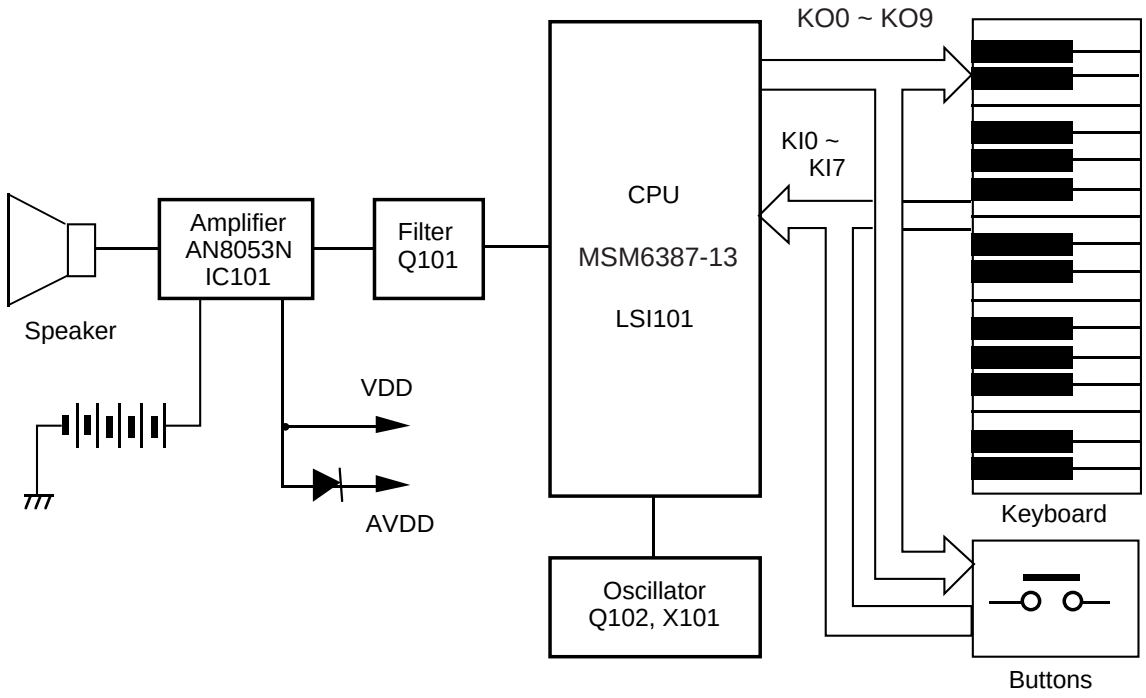
ELECTRICAL

Current drain with 9V DC:	
No sound output	34 mA ± 20%
Maximum volume with keys C3, D3, E3 and F3 pressed in Church Organ tone, Volume; Maximum	110 mA ± 20%
Speaker Output Level at 4 Ω load: with key E2 pressed in Church Organ tone Volume; Maximum	510 mV ± 20 %
Minimum operating voltage:	5.5 V

Nomenclature of Keys



BLOCK DIAGRAM



CIRCUIT DESCRIPTION

Key Matrix

	KI0	KI1	KI2	KI3	KI4	KI5	KI6	KI7
KO0	0	1	C2	C#2	D2	D#2	E2	F2
KO1	2	3	F#2	G2	G#2	A2	A#2	B2
KO2	4	5	C3	C#3	D3	D#3	E3	F3
KO3	6	7	F#3	G3	G#3	A3	A#3	B3
KO4	8	9	C4	C#4	D4	D#4	E4	F4
KO5	Tone	Rhythm	F#4	G4	G#4	A4	A#4	B4
KO6	Tempo Up	Tempo Down	C5	C#5	D5	D#5	E5	F5
KO7	Start/ Stop	Fill-In	F#5	G5	G#5	A5	A#5	B5
KO8	Demo		C6					
KO9						Normal	Fingered	CASIO Chord

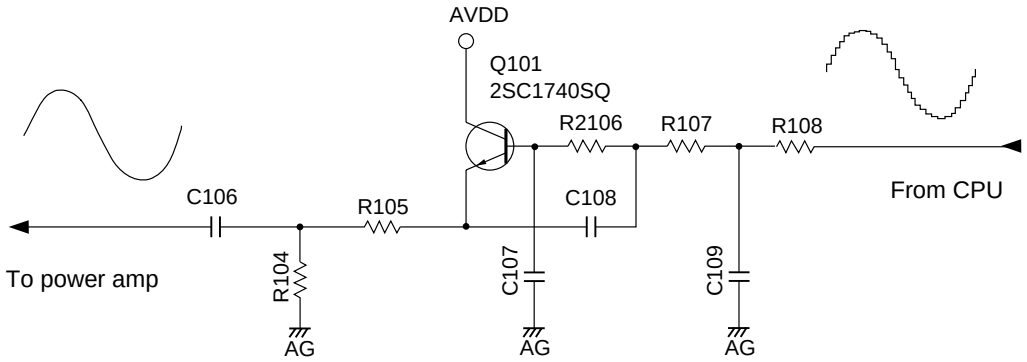
CPU (LSI101: MSM6387-13)

Containing a sound data ROM and a DAC (Digital to Analog Convertor), the CPU provides sound waveform in accodance with the pressed key and the selected tone.
The following table shows the pin functions of LSI101.

Pin No.	Terminal	In/Out	Function
1, 2	TEST1, TEST2	——	Not used. Connected to ground.
3	RESET	In	Power ON reset terminal. On: +5 V Off: 0 V
4	AVDD	In	+5 V source for the built-in DAC
5	OUT	Out	Sound waveform output
6	AGND	In	Ground (0 V) source for the built-in DAC
7	GND	In	Ground (0 V) source
8	COSI	In	21.725 MHz clock pulse input
9	COSO	——	Not used
10	VDD	In	+5 V source
11 ~ 18	KI0 ~ KI7	In	Input terminals from keys and switches
19, 20	KO11, KO10	——	Not used
21 ~ 30	KO9 ~ KO0	Out	Key and switch scan signal outputs

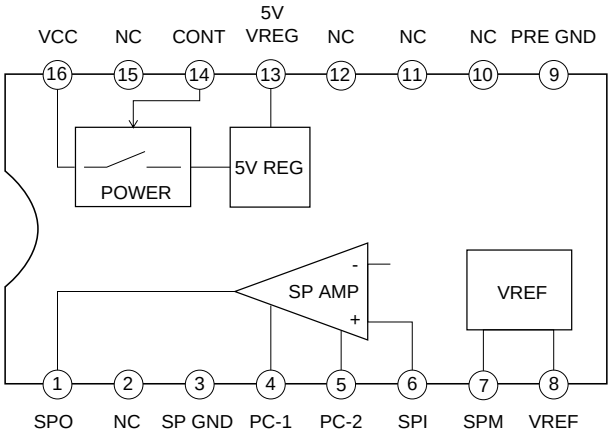
Filter Block

Since the sound signal from the CPU is a stepped waveform, the filter block is added to smooth the waveform.

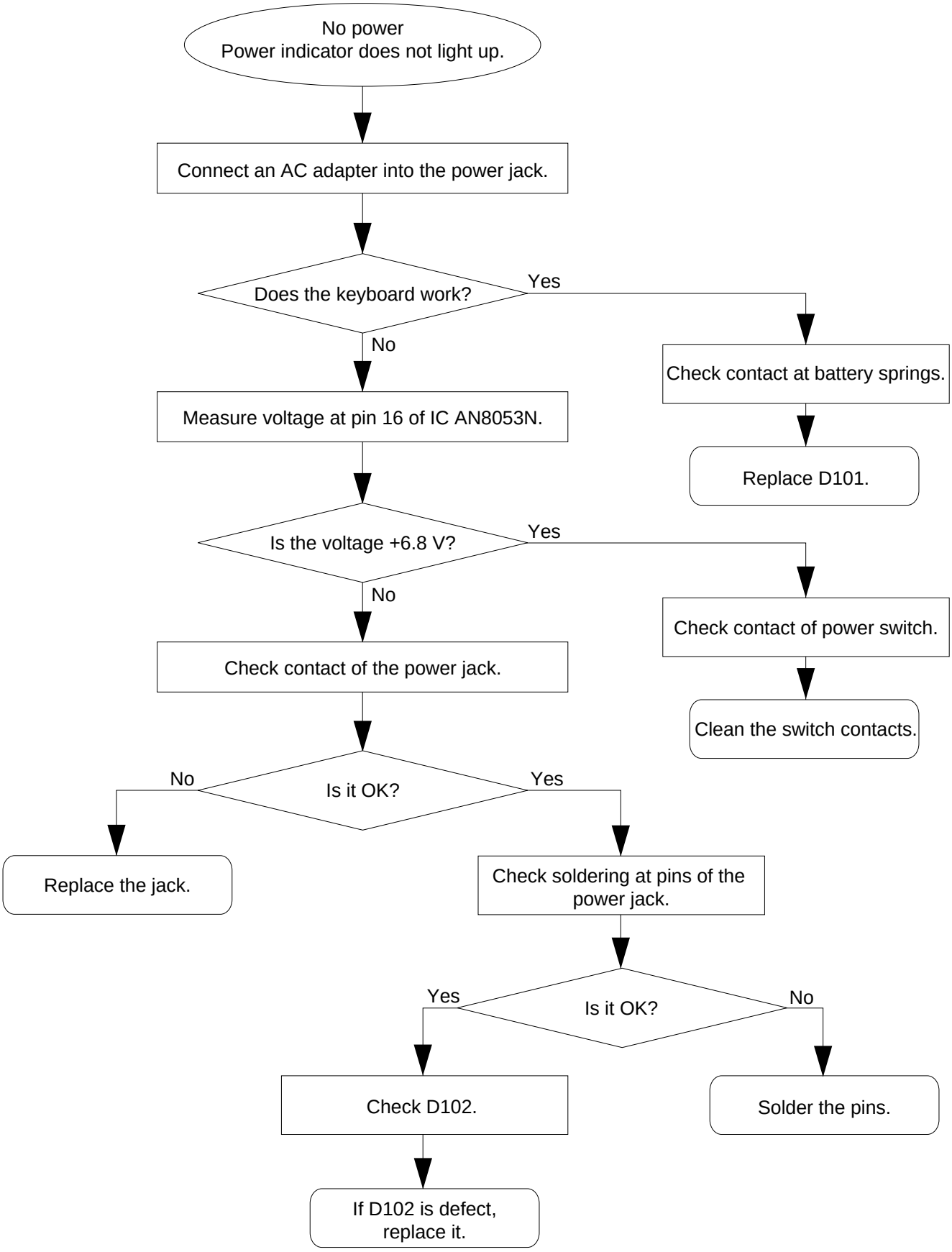


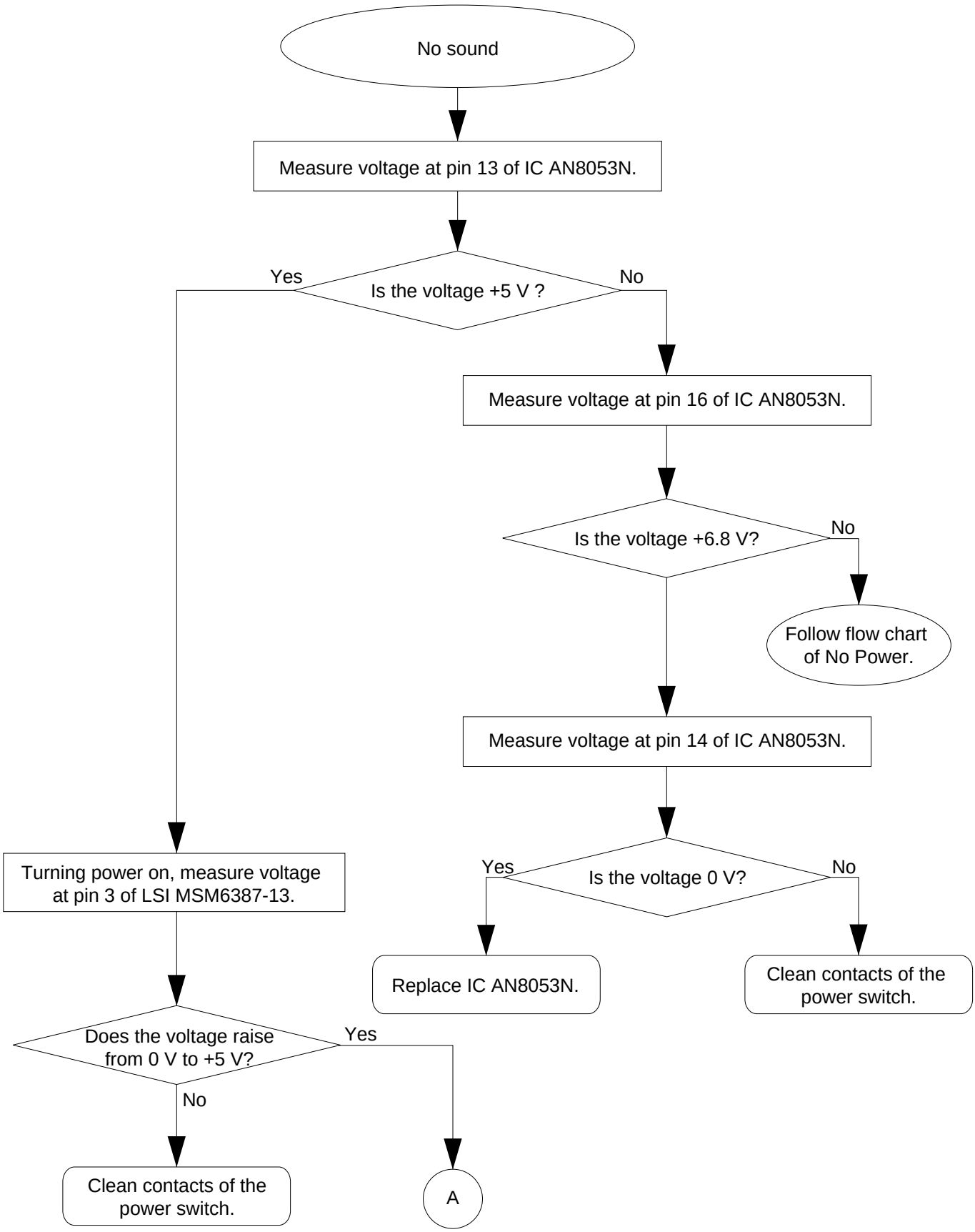
Amplifier/Voltage Regulator (IC101: AN8053N)

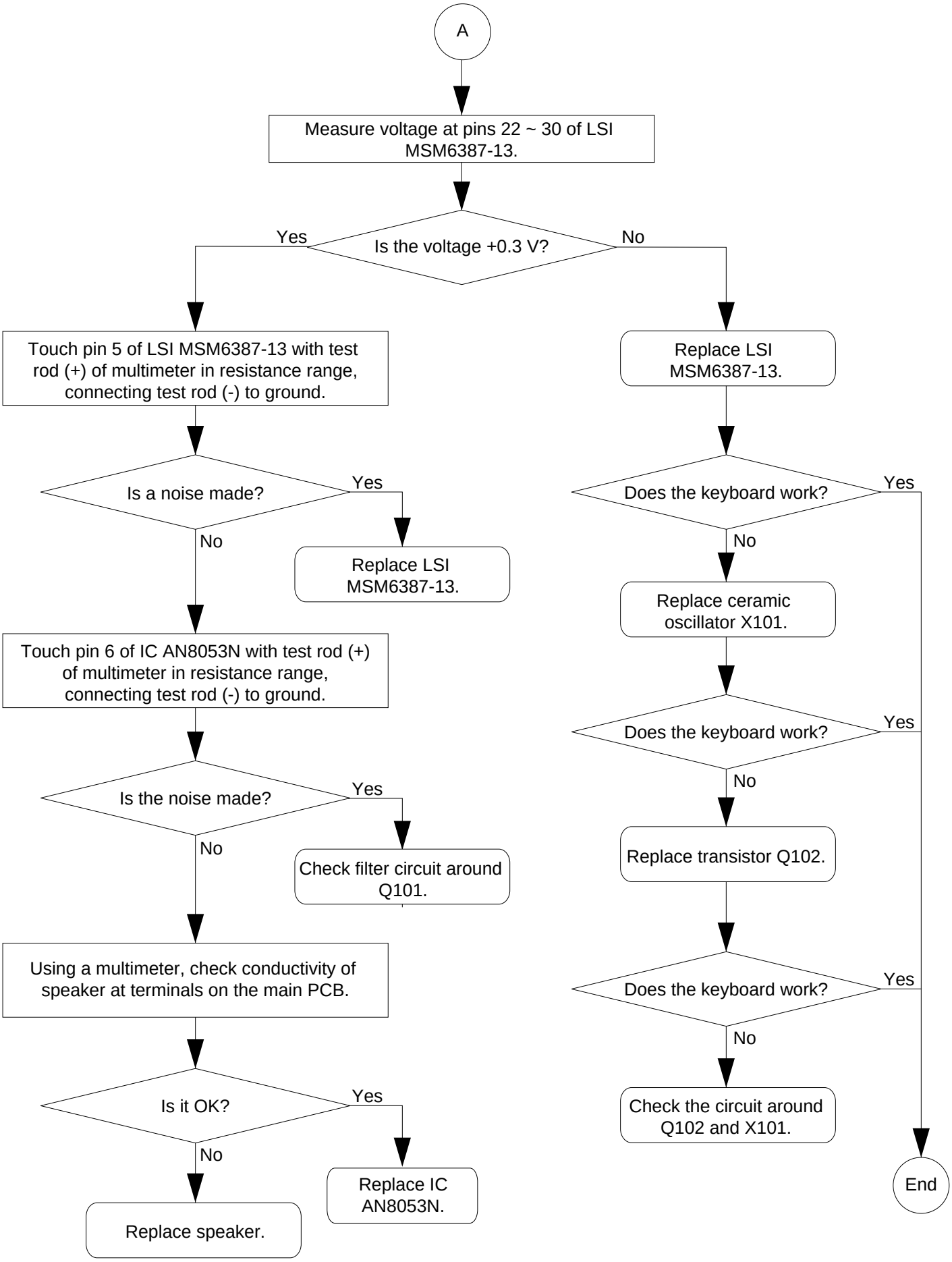
The right figure shows the internal block of IC101.



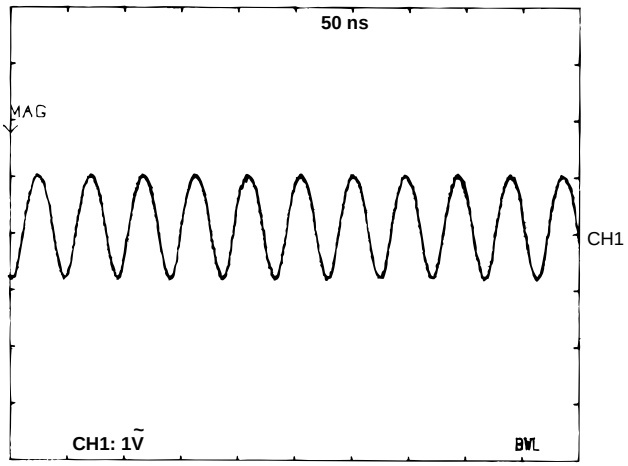
TROUBLESHOOTING



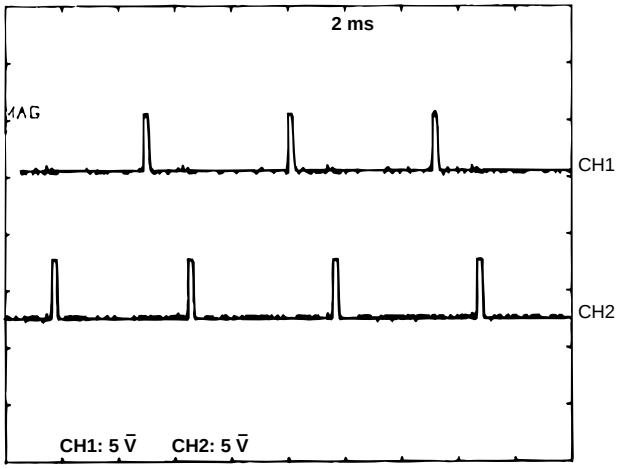

No sound
Measure voltage at pin 13 of IC AN8053N.
Yes
Is the voltage +5 V ?
No
Measure voltage at pin 16 of IC AN8053N.
Is the voltage +6.8 V?
No
Follow flow chart of No Power.
Measure voltage at pin 14 of IC AN8053N.
Yes
Is the voltage 0 V?
No
Replace IC AN8053N.
Clean contacts of the power switch.
Turning power on, measure voltage at pin 3 of LSI MSM6387-13.
Does the voltage raise from 0 V to +5 V?
Yes
No
Clean contacts of the power switch.
A


A
Measure voltage at pins 22 ~ 30 of LSI MSM6387-13.
Is the voltage +0.3 V?
Yes
No
Touch pin 5 of LSI MSM6387-13 with test rod (+) of multimeter in resistance range, connecting test rod (-) to ground.
Is a noise made?
Yes
No
Replace LSI MSM6387-13.
Touch pin 6 of IC AN8053N with test rod (+) of multimeter in resistance range, connecting test rod (-) to ground.
Is the noise made?
Yes
No
Check filter circuit around Q101.
Using a multimeter, check conductivity of speaker at terminals on the main PCB.
Is it OK?
Yes
No
Replace IC AN8053N.
Replace speaker.
Replace LSI MSM6387-13.
Does the keyboard work?
Yes
No
Replace ceramic oscillator X101.
Does the keyboard work?
Yes
No
Replace transistor Q102.
Does the keyboard work?
Yes
No
Check the circuit around Q102 and X101.
End

MAJOR WAVEFORMS

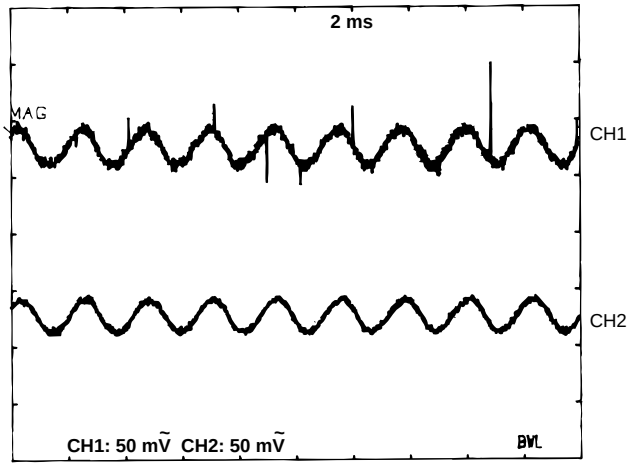


① Clock pulse COSI
MSM6387-13 pin 8



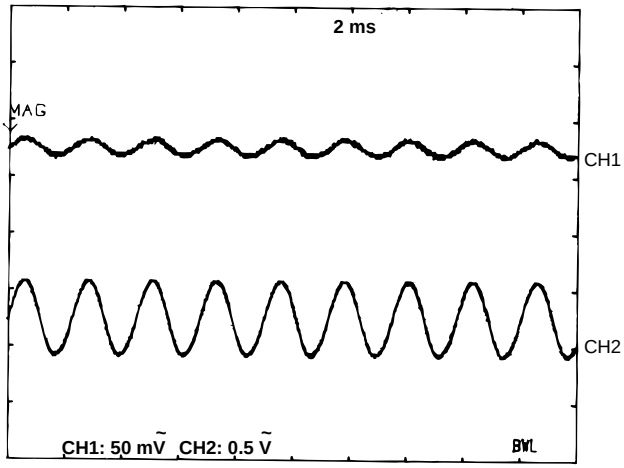
② Key scan signal KO0
MSM6387-13 pin 30

③ Key scan signal KO1
MSM6387-13 pin 29



④ Sound signal output
MSM6387-13 pin 5

⑤ Filter output
Collector of Q101

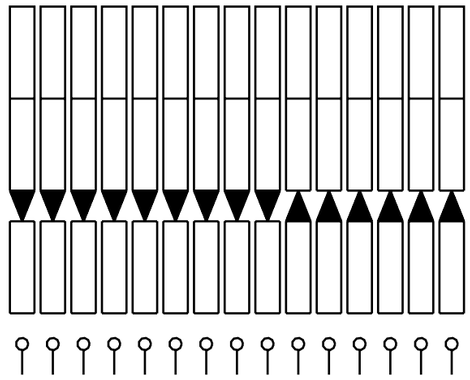


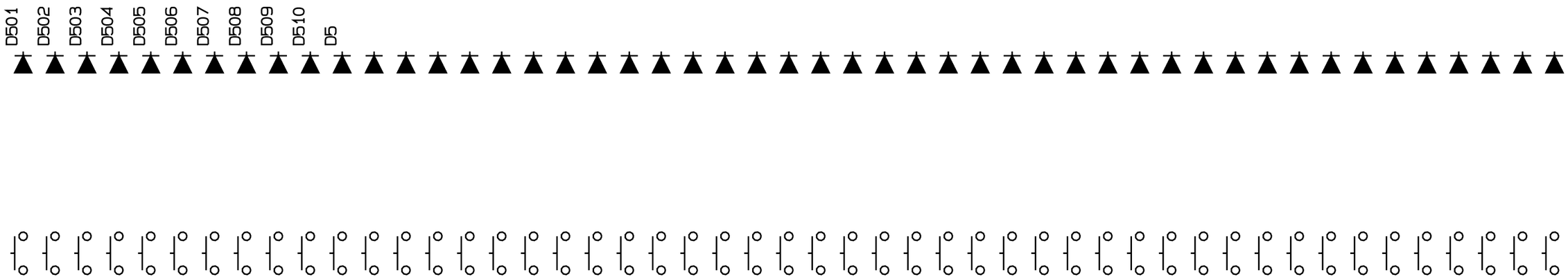
⑥ Power amp input
AN8053N pin 6

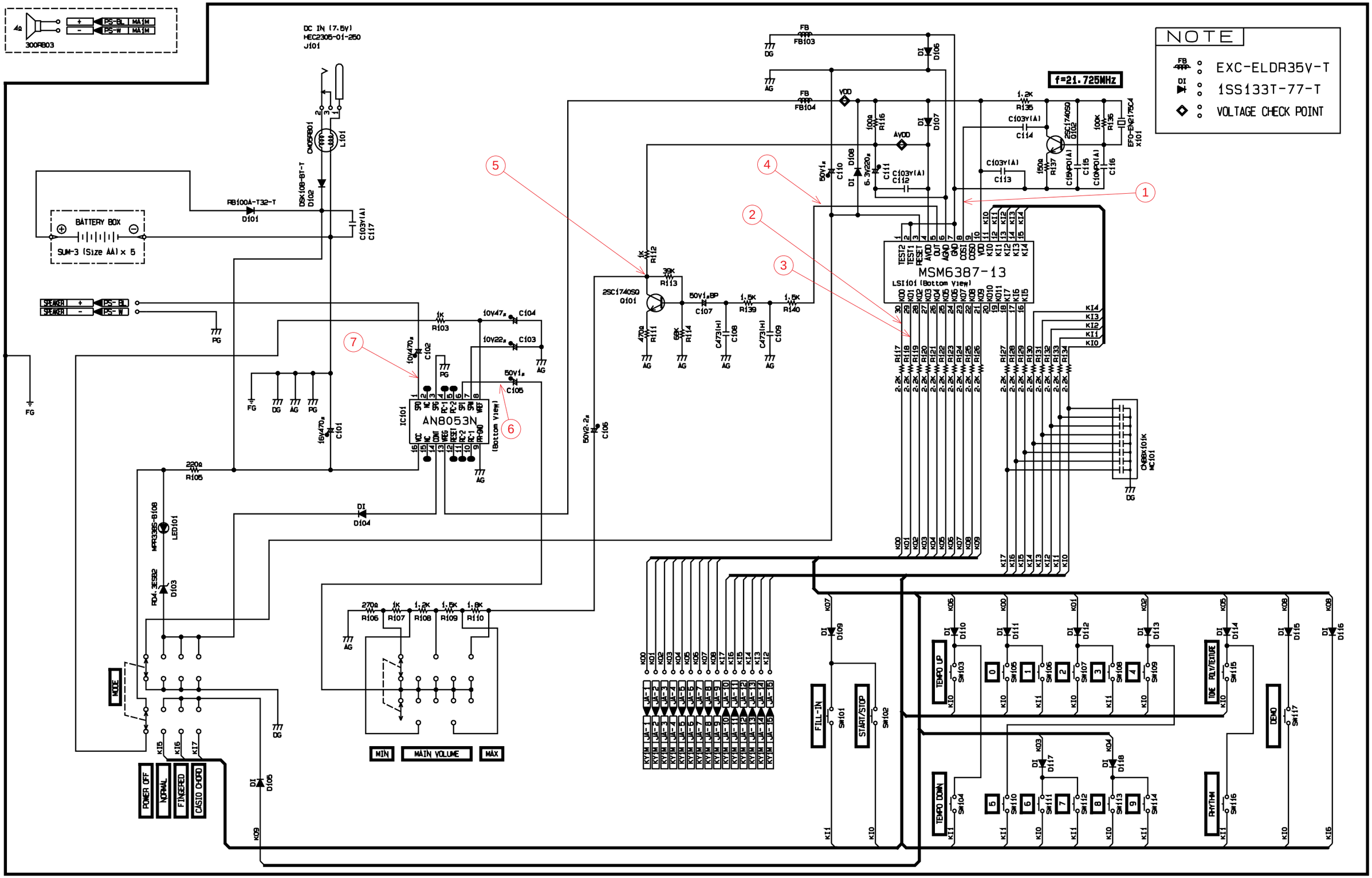
⑦ Power amp output
AN8053N pin 1

Tone : Flute (No.13)
Key : A3
Volume : Maximum

SCHEMATIC DIAGRAMS

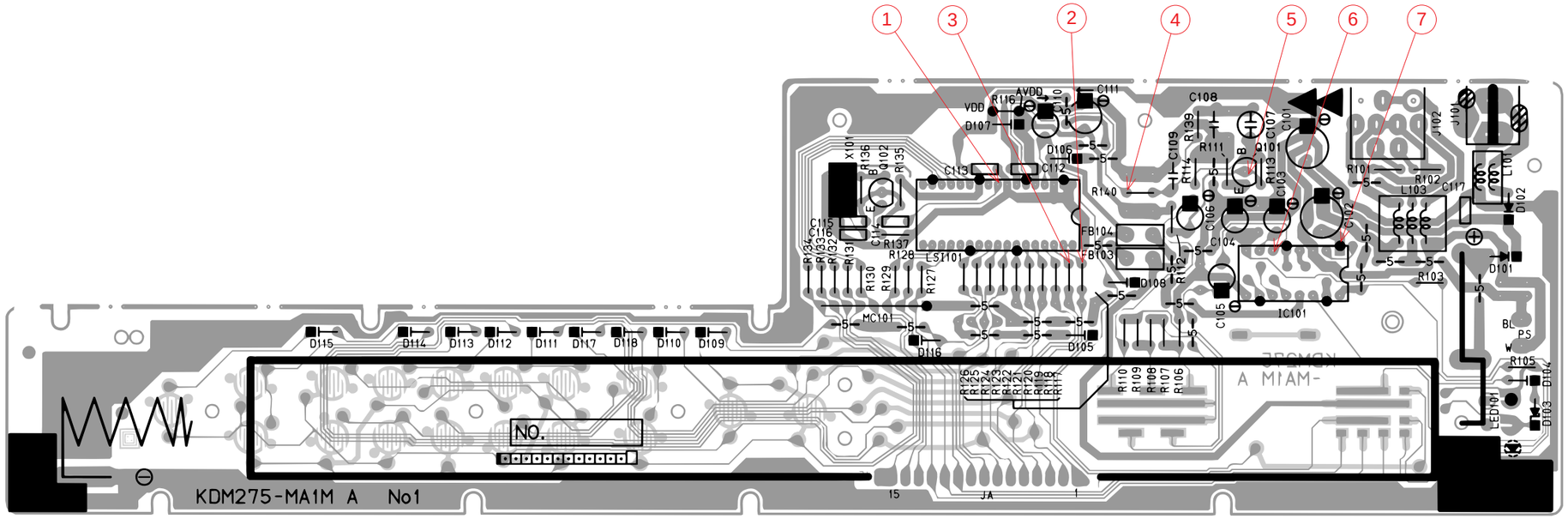




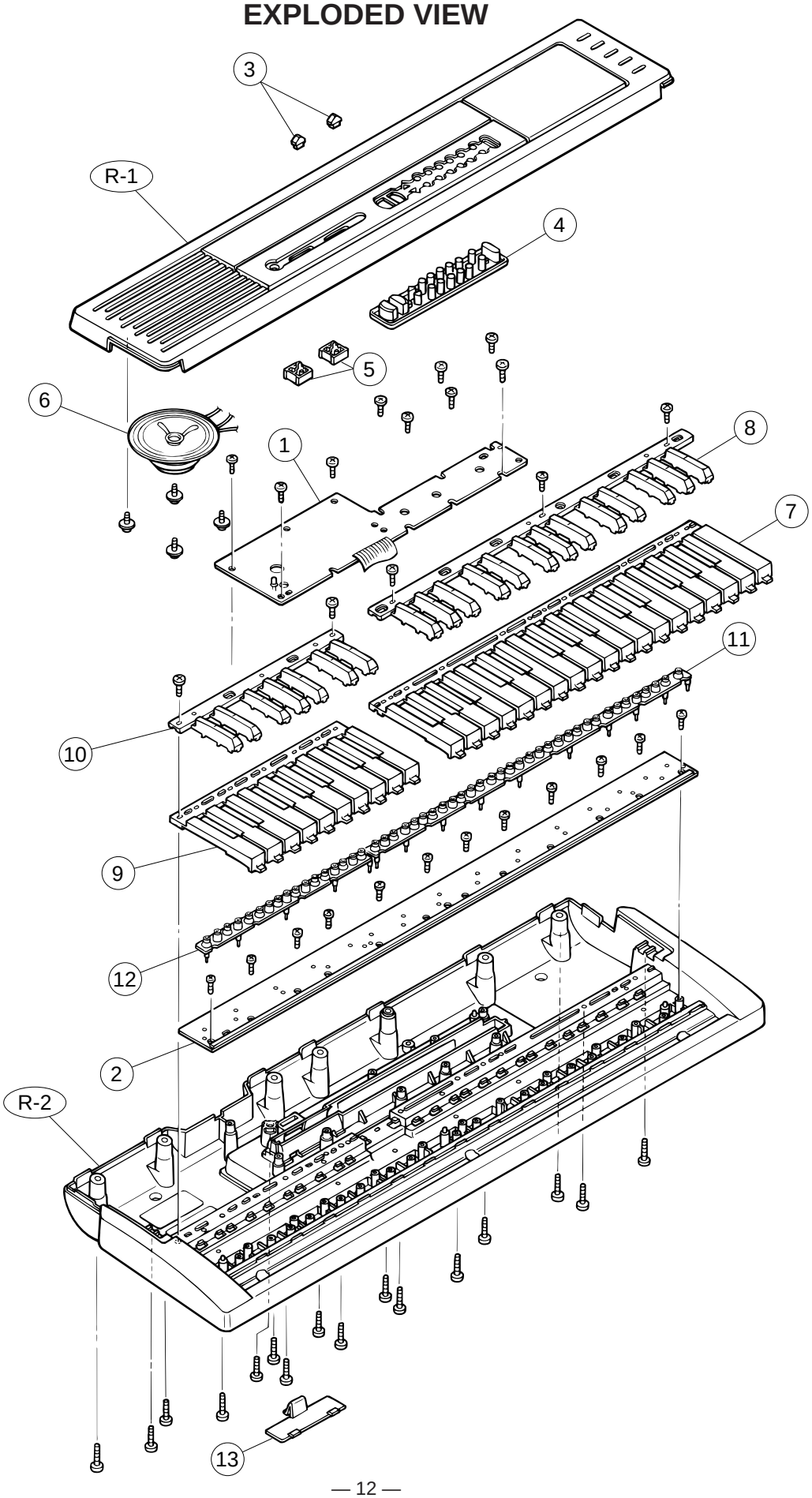

NOTE
FB EXC-ELDR35V-T
DI 1SS133T-77-T
VOLTAGE CHECK POINT
f=21.725MHz
MSM6387-13
LSI101 (Bottom View)
AN8053N
IC101 (Bottom View)
DC IN (7.5V)
HEC2305-01-250
J101
BATTERY BOX
SUM-3 (Size AA) x 5
300PB03
SPEAKER
MODE
POWER OFF
NORMAL
FINGERED
CASIO CHORD
MIN
MAIN VOLUME
MAX
TEMPO UP
TEMPO DOWN
FILL-IN
START/STOP
TONE REV/REVERB
DEMO
RHYTHM
1
2
3
4
5
6
7

PCB VIEW

Main PCB



EXPLODED VIEW



PARTS LIST

MA-100

Notes: This parts list does not include the cosmetic parts, which parts are marked with item No. "R-X" in the exploded view.
Contact our spare parts department if you need these parts for refurbish.

1. Prices and specifications are subject to change without prior notice.

2. As for spare parts order and supply, refer to the "GUIDEBOOK for Spare parts Supply", published seperately.

3. The numbers in item column correspond to the same numbers in drawing.

N	Item	Code No.	Parts Name	Specification	Q	FOB Japan N.R.Yen Unit Price	R
	IC101	2114 3269	IC, Power Amp.	AN8053N	1		A
	LSI101	2011 2961	LSI, CPU	MSM6387-13	1		A
	Q101, 102	2220 1387	Transistor	2SC1740SQ-TP-T	2		B
	D101	2390 1323	Diode	RB100A-T32-T	1		B
	D102	2390 0371	Diode	DSK10B-BT-T	1		B
	D103	2310 7848	Zener diode	RD4. 3ESB2-T1-T	1		A
	X101	2590 1897	Ceramic oscillator	EFO-EN2175C4	1		B
	J101	3501 3731	Power jack	HEC2305-01-250	1		A
N	1	6925 0500	PCB ass'y, MA1M	M240352*1	1		B
N	2	6925 0510	PCB ass'y, KY	M240353*1	1		B
	3	6921 5031	Slide knob	M311859A-1	2		B
N	4	6925 0540	Button, Rubber	M240278-1	1		B
	5	6909 5890	Slide contact	CSB-12D	2		B
N	6	3831 1029	Speaker	300RB03	1		B
N	7	6925 0550	White key set, 19-key	M140301-1	1		A
N	8	6925 0560	Black key set, 13-key	M140302-1	1		A
N	9	6925 0570	White key set, 10-key	M140303-1	1		A
N	10	6925 0580	Black key set, 7-key	M140304-1	1		A
N	11	6925 0590	Key contact rubber, 32-contact	M240287-1	1		B
N	12	6925 0600	Key contact rubber, 17-contact	M240288-1	1		B
	13	6906 7511	Battery cover	M312197A*3	1		B

Notes: N – New parts
R – Rank

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